Nanomedicine & Biotherapeutic Discovery

Extended Abstract

Modeling of a Reactor Preparation Ethylene from Methane

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Abstract

In this study, catalytic oxygenation of methane and the influence of various factors in the process of ethylene production were studied. Based on the results obtained, the optimal conditions and the structure of the catalyst were chosen : $(Mn_2O_3)_x \cdot (Na_2MoO_4)_y \cdot (ZrO_2)_z$. The process was thermodynamically evaluated to obtain the most appropriate technology for extracting ethylene from methane, and the effect of various technological parameters on its main characteristics for mathematical modelling of the reactor was investigated.

Uzbekistan has vast reserves of oil and natural gas. Natural gas and oil are known to be reserves of non-renewable and limited raw materials. The rational use of oil and gas will help develop the chemical industry at a higher level. Particular attention is paid to the use of highly efficient, low-waste, economical, environmentally friendly technologies and environmental protection for the efficient use of oil and natural gas. Based on the foregoing, one of the main challenges facing the scientists of the world is the introduction of new methods of producing sync. Tactical materials important for the national economy, which can replace products imported on the basis of local raw materials and industrial waste, and without waste, environmentally friendly, high-quality and competitive. The development of new technologies, At the same time, the only reasonable way to process natural gas is through oxygenation. This process occurs at one stage and at atmospheric pressure. This process passes through ethane and ethane is dehydrated with ethylene production. Considering the whole substance, you can write the following sequence of reactions.

The gaseous products of the reaction was analyzed using a "Gazokhrom3101" thermochemical detector using the following thermostat: Thermostat temperature is 100°C, transport gas (air) flow rate is 35 ml/min, the length of the column filled with activated carbon is 1 m, internal diameter is 3 mm. Quantitative analysis was carried out by the absolute rating method. The catalytic activity of more than 10 catalysts was tested for the reaction of methane oxygenation. As is known, manganesebased catalysts have high catalytic activity and selectivity in the process of ethylene oxidation with methane. Therefore, we learned that manganese-based catalysts are a promoter feature of various compounds.

The introduction of the ZrO_2 catalyst had a positive effect on its activation. When added ZrO_2 catalyst, the efficiency of ethylene increased from 32.9% to 42.8% and the selectivity to ethylene from 76.5 to 81.4% respectively. Further experiments www.tsijournals.com |March-2020 3 (Mn_2O_3) x· (Na_2MoO_4) y (ZrO_2) z with the participation of an optimal catalyst were carried out. The conversion of methane depends on the C2-hydrocarbon process, depends on the catalytic composition used, but also depends on the reaction conditions (temperature, methane, air, specific bulk velocity). Thus, we learned the effect of various factors on the reaction rate. The bulk velocity was investigated at a temperature of 800°C and a ratio of CH_4: air=1: 2. The change in bulk velocity was achieved by changing the size of the catalyst, which must be applied to the reactor. The first methane-air mixture was sent continuously.

However, it was noted that additional products are formed (decomposition of ethylene). The optimal value of the bulk velocity is 1000 h^{-1}, the value of ethylene is 42.8%, and the selectivity is 81.4%. The effect of temperature on the methane oxidation reaction was investigated at constant bulk velocity (1000 h^{-1}) and methane: air=1: 2 with the presence of a catalyst of optimal composition with a range of 50°at intervals of 600-850°C. Production of ethylene starts at 600°C. The highest ethylene yield was observed at 800°C. Increasing the temperature from the optimum temperature can degrade the process. Therefore, the ethylene content and selectivity decrease.

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The effect of methane: air with temperatures of 800°C and a bulk velocity of 1000 h-1. To study the kinetic regularities of the methane oxygenation reaction, the effect of methane and oxygen partial pressure on the rate of production of ethylene at a temperature of 700 ÷ 800°C and a bulk velocity 600 ÷ 1200 h-1. In studying the effect of the partial pressure of the reactants on the process flow laws changed the partial pressure of the gas and left the latter unchanged. In order not to change the linear rate, the required amount of argon gas was sent to the reaction zone. The catalyst size was adapted to the specific velocity test conditions for permanent storage.

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